Web Accessibility: Here Comes Section 508 -- Like It or Not

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What IS Web Accessibility

What does "Web accessibility" mean? To me, it means that anyone using any kind of Web browsing technology must be able to visit any site and get a full and complete understanding of the information as well as have the full and complete ability to interact with the site - if that is necessary.

Chuck Letourneau, Starling Access Services © 1998

Web Users: Anyone & Anywhere

✓ Older Browser - IE or Navigator 3.X

✓ Alternate Browser - Lynx, Opera, iCab

✓ Low Bandwidth - 28.8/33.6/56 kbps

✓ Alternate Platforms - WebTV

✓ New Devices - PDAs, Cell Phones, Car Computers (voice browser)

Web Accessibility - A Measure

"Web accessibility is a measure of how easy it is to access, read, and understand the content of a web site"

Keys to making a page accessible

- Standards compliance
- Intelligent organization
- Graceful degradation

Graceful Degradation

The HTML standards were written with graceful degradation in mind

- Key to ensuring that pages are readable and accessible in all browsers IF utilized
- New attributes to tags are designed to be safely ignored so the rest of the tag functions normally
- New tags have alternative display for browsers that don't support them

What is Section 508?

(technically Section 508b)

✓Workforce Investment Act of 1998

✓Federal agencies' electronic and information technology is to be accessible to people with disabilities

– Employees

– Public

Department of Justice
Section 508 Home Page

http://www.usdoj.gov/crt/508/508home.html

✓ Section 508 in HTML
– http://www.usdoj.gov/crt/508/508law.html

✓ Section 508 in PDF
– http://www.usdoj.gov/crt/508/508law.pdf

Architectural and Transportation Barriers Compliance Board

✓ Independent Federal Agency

- Created in 1973
- Primary mission is accessibility for people with disabilities
- Directed to publish Federal standards by February 7, 2000
- Target implementation date August 7, 2000

The Electronic and Information Technology Access Advisory Committee

✓ Develop set of recommended standards for achieving accessibility to technology and information by individuals with disabilities

✓ Final Report dated May 12, 1999

http://www.access-board.gov/pubs/eitaacrpt.htm

✓ Update on Proposed Access Standards

http://www.access-board.gov/508Update.htm

EITAAC Final Report - Web Sites

Section 5.3, Technology Specific Standards

5.3.3.1 Web content shall conform with level 'Double-A', satisfying all Priority 1 and 2 checkpoints, of the World Wide Web Consortium (W3C) "Web Content Accessibility Guidelines 1.0"

Final Report - Web Sites (Cont'd)

✓5.3.3.2 Tools for authoring Web page and sites

  Authoring Tool Accessibility Guidelines

✓ 5.3.3.3 User agents (Browsers)

  User Agent Accessibility Guidelines

✓5.3.3.4 Navigation links or tool bars at the top and left side of your page

✓5.3.3.5 ASCII art

Proposed Federal Standards

✓ On March 31, 2000, the Access Board published proposed standards for electronic and information technology that were available for public comment for 60 days

  http://www.access-board.gov/rules/508nprm.htm

✓ Rules

  http://www.section508.gov/rules.html

  http://www.access-board.gov/sec508/nprm.htm

Economic Assessment

✓Section 508 of the Rehabilitation Act
Amendments of 1998 29 U.S.C. §794(d)

http://www.access-board.gov/sec508/508-reg-assess.pdf

http://www.access-board.gov/sec508/508-reg-assess.htm

✓Federal cost range $85 million to $691
million annually

– Largely hardware and software procurement

– Web site cost estimate relatively small

Estimated Cost of Proposed Rule

✓ Major sources of cost include:
- – Costs of modifying technology
- – Training of staff
- – Translation of documentation and instructions

✓ The total quantified cost ranges from $177 million to $1,068 million annually

✓ The Federal proportion is estimated to range between $85 million and $691 million

Estimated Cost (continued)

✓ This cost must be placed in appropriate context

✓ The lower and upper bound of the estimated cost represent a range of 0.23 percent to 2.8 percent of the $38 billion spent by the Federal government on information technology in fiscal year 1999

Implementation

✓Section 508 exempts only national security systems

✓E&IT hardware, software, and services will be phased in via procurement

✓Web sites

– Federal standards

– Agency plans

Internet and HTML Accessibility

✓ W3C Web Accessibility Initiative
http://www.w3.org/WAI/

✓ National Center for Accessible Media
http://www.wgbh.org/wgbh/pages/ncam/

✓ DO-IT Accessible Web Page Design
http://www.washington.edu/doit/Resources/web-design.html

✓ WebABLE!
http://www.webable.com/

Web Content Accessibility Guidelines 1.0

http://www.w3.org/TR/WAI-WEBCONTENT/

✓ Goals

– Promote accessibility

– Make Web content more available

- desktop browser

- voice browser

- mobile phone

Web Content Accessibility Checkpoint List

http://www.w3.org/TR/WAI-WEBCONTENT/full-checklist.html

✓ Each checkpoint has one of three priority levels based on accessibility impact

✓ Priority 1

A Web content developer **must** satisfy this checkpoint. Otherwise, one or more groups will find it impossible to access information in the document.

Web Content Accessibility Checkpoint List (Cont'd)

✓ Priority 2

- – A Web content developer **should** satisfy this checkpoint. Otherwise, some will find it difficult to access information in the document.

✓ Priority 3

- – A Web content developer **may** address this checkpoint. Otherwise, some will find it somewhat difficult to access.

Web Content Accessibility Checkpoint List (Cont'd)

✓ Three levels of conformance

✓ Conformance Level "A": all Priority 1 checkpoints are satisfied

✓ Conformance Level "Double-A": all Priority 1 and 2 checkpoints are satisfied

✓ Conformance Level "Triple-A": all Priority 1, 2, and 3 checkpoints are satisfied

WAI Web Content Accessibility Guidelines Curriculum

http://www.starlingweb.com/wai/wcag/

✓ Introductory Section

✓ Guidelines for Web Content Accessibility

✓ Checkpoints for Guideline Requirements

✓ Examples for Implementing Checkpoints

Federal Accessibility Standards

Proposed Web Standards

Contractor Obligations

✓ Contractors are not required to procure accessible hardware and software to carry out government related activities, unless contract calls for delivery

✓ Similarly, if a firm is contracted to develop a web site for a Federal agency, the web site created must be fully compliant, but the firm's own web site would not be covered

Agency Obligations

✓ Federal agency must comply with the standards when it develops, procures, maintains or uses electronic and information technology, including web-based information and applications

✓ Federal agency must comply with these standards unless to do so would be an undue burden

Agency Website - Example 1

✓Federal agency enters into a procurement contract with an outside entity for the development of an agency web site

– That web site has to meet the standards, unless to do so would be an undue burden

✓Federal agency develops its own web site

– That web site has to meet the standards, unless to do so would be an undue burden

Agency Website - Example 2

✓ An agency has an existing web site and enters into a procurement contract with an outside entity to develop new pages

  – The new pages have to meet the standards unless to do so would be an undue burden

✓ With respect to the preexisting web site, the agency may be required to develop a plan to make it accessible over a period of time.

Agency Accessibility Plans

✓General Services Administration (GSA) Draft Guidance

– Agency IT Accessibility Coordinator

– IT Accessibility Team

✓Demonstrate Commitment

– Principle and top 20 Web sites accessible

– 10th Anniversary of the ADA on July 26, 2000

Agency Accessibility Plans (con't)

✓ GSA staff will work with agency IT Accessibility Coordinators

✓ GSA planning seminars and workshops

✓ Guidelines for establishing agency IT Accessibility Teams have been distributed

✓ Participation by employees with disabilities on these teams is encouraged.

Paragraph (c)(1)

✓ A text equivalent shall be provided for every non-text element

   – For example, a link or graphic on a Web page that indicates an action or a URL that cannot be interpreted by assistive technology.

✓ This provision requires that an alternative text label be assigned to that link or graphic

Paragraph (c)(2)

✓ Alternatives are required for color based prompting

 – Web pages are required to indicate with text that which is evident by using color

✓ For example, a statement should read "press the green button labeled start to begin," and the word "start" should be associated with the green button

Paragraph (c)(3)

✓ The user shall be alerted to a change in the natural language of a Web page

✓ For example, this requirement can be met when a Web page changes from English to French by adding text which reads "the following paragraph is presented in French"

Paragraph (c)(4)

✓ Documents must be readable without requiring style sheets

- – Style sheets are a relatively new technology
- – This does not prohibit use of style sheets

✓ Newer browsers allow user defined style sheets to improve accessibility

- – Use of style sheets that interfere with user defined style sheets is prohibited

Paragraph (c)(5)

✓ When alternative access to web page content, such as captioning of audio programs or multimedia, is provided, that alternative must be updated on the screen every time the content changes

✓ See Paragraph (c)(12)

Paragraph (c)(6)

✓Redundant text links must be provided for each active region of a server-side image map

– Browsers cannot communicate the URL that will be followed when a region of the map is activated

– The redundant text link is necessary to provide access to the page for anyone not able to see or load the map.

Paragraph (c)(7)

✓ Client-side image maps must be used whenever possible in place of server-side image maps

- When a web page downloads a client-side image map to a browser, it also sends all the information about what action will happen when a region of the map is pressed.

- Client-side image maps show the links related to the map in a text format.

Paragraphs (c)(8) & (c)(9)

- ✓ Use of tables is permitted, but requires that the tables be coded according to proper HTML rules

- ✓ Many assistive technology applications can interpret the HTML coding of tables

Paragraphs (c)(10)

✓Frames can be an asset to users of screen readers if the labels on the frames are explicit

- Such labels as top, bottom, or left, provide few clues as to what is contained in the frame
- Labels such as "navigation bar" or "main content" are more meaningful and facilitate frame identification and navigation.

Paragraphs (c)(11)

✔ Scripts, applets, or other plug-ins must not be essential to reading or navigating a Web page

– When the content or navigation of a web page relies on scripts or requires that a user have a specific plug-in installed, the result can be an inaccessible page

Paragraphs (c)(11) continued

✓ If a page cannot be created with text attributes for navigation and content that do not require a plug-in, then an alternate text page may be the only solution

NOTE

The Board recommends that access features be incorporated into all web pages without resorting to alternative text pages

Paragraphs (c)(12)

✓ When features such as captioning for audio output or descriptive audio for graphics is provided, the captioning or description must be presented in a synchronous manner

Exactly how this differs from (c)(5) is not clear to me

Paragraphs (c)(13)

✔ An appropriate method must be used to facilitate the easy tracking of page content

- It is common for web authors to place navigation links at the top, bottom, or side of every new page
- Use of repetitive navigation links forces persons with visual impairments to re-read these links when moving to every new page
- Provide users with the option to skip repetitive navigation links

NASA/GSFC Resources

✓GSFC Webmasters Access

  http://webmaster.gsfc.nasa.gov/access/

✓Website Accessibility Guidelines

  draft, no link as yet

Department of Justice, General Services Administration, and World Wide Web Consortia Base Documents and Reference Materials

- Regulatory Assessment of NPRM
  (Notice of Proposed Rule Making from U.S. Architectural and Transportation Barriers Compliance Board)
- WORKFORCE INVESTMENT ACT OF 1998
  SEC. 508. ELECTRONIC AND INFORMATION TECHNOLOGY
- Questions & Answers about Section 508 of the Rehabilitation Act Amendments of 1998
- Department of Justice listing of all relevant documents pertaining to Section 508
- World Wide Web Consortia Web Accessibility Guidelines
- Web Accessibility Guidelines Checklist
- World Wide Web Consortia HTML 4.01 Specification
  Contents & Index Section
- World Wide Web Consortia HTML 4.01 Tag Attribute Index

NASA Accessibility Guideline Checklist and Explanations

No.	Web Practice	Accessibility Standard Links go to tag reference at **V3C**.	Explanation Links go to more information and examples at **CAST** or **V3C**.
1.	Text equivalent	Every non-text element shall be provided via "alt" (alternative text attribute), "longdesc" (long description tag) or in element content.	The "alt" text tag provides a title or descriptive phrase about the image it accompanies. This is essential for users of reader software who are vision impaired and it is valuable for users of graphical browsers who have "load images" turned off. It is also useful for users of text-only WWW tools like Lynx. The "longdesc" tag can be essential when an image conveys important information such as *what about the image represents a discovery if the image is a science result image.*
2.	Web page design	All information conveyed with color must be available without color. Good primer on Color Blindness *Link used with author's permission.*	Thirty percent of all males suffer from some form of color deficiency rendering colors as grays or spreading one color across several others. Choose text and background colors to provide maximum contrast. Contrast is also very important for individuals who can see but have reduced vision. Good design also refers to the ability of reader software to properly parse a page correctly left to right and up to down.
3.	Language identification	Changes in natural language of document text and alt text equivalents must be clearly identified.	The new HTML 4.x specification calls for identification of the language of the site or page using the "lang" tag. This has important implications for international sites and also when using style sheets. Correctly tagged web pages, when seen by browsers with appropriate ISO character sets installed will properly render specific language character sets including accents and special characters or entities.
4.	Organization	Must be readable without requiring an associated style sheet	Style sheets present a double-edged sword: Only the latest browsers support the specification and when using them the text still needs to be able to be parsed correctly by reader software.

NASA Accessibility Guideline Checklist and Explanations

5.	Dynamic content	Web pages shall update equivalents when the dynamic content changes.	Some scripts enable dynamic content to be generated based upon user input and server-side interaction (asp, cf, cgi, etc.). When the content changes for an image or a link or another object, the "alt" contents of the changed element should be included. This may be easier to accomplish for database-driven changes since "alt" tag information can be stored as well. This also applies to sites using frames.
6.	Server-side image maps	Redundant text links shall be provided for each active region.	Most sites have moved away from server-side image maps. The exception is for such things as geographical information system clickable maps.
7.	Client-side image maps	Provide whenever possible in place of server-side image maps.	Modern browsers support client-side image maps, with the addition of "alt" text tags for the image hot spots, assistive technology readers can provide additional clues. However, if the user has "load images" turned off, the only approach is to provide alternative links elsewhere on the same page.
8.	Data tables	Provide information of row and column headers.	Using row and column headers becomes crucial when a table is larger than two columns or two rows. Without the headers, assistive technology such as reader software can only recite the table contents with no reference to what that column or row pertains to. *See below.*
9.	Multi-logic row or column headers	Provide markup to associate data cells and header cells for data tables.	Additional information such as "summary" and "scope" can be applied to data tables to render their contents and intent meaningful to users of assistive technology. "Scope," in particular, can be very useful for column headers. *See above.*
10.	Frames	Must be titled with text that facilitates identification and navigation.	Frames present unique obstacles to users of reader software. A frame-based page should always include an alternative layout (text only) inside a "noframe" element. Also, with the "title," "name" and "longdesc" tags, frames can be made more navigable for reader software.

NASA Accessibility Guideline Checklist and Explanations

11.	Page availability	Must be usable when scripts, applets, or other programmatic objects are turned off or not supported, or provide equivalent information on an alternative page	When using "script," try and include a "no script" alternate. HTML 4.x specifies the use of "object" over "applet" or "frame" and as an additional element type for "img". When using "object" or the HTML 3.x "applet" or "frame" elements, include "alt" text. Always include "alt" text for "img" references.
12.	Equivalent alternatives	Must be synchronized with any multimedia presentation.	This is similar to Number 5 (Dynamic content Web pages shall update equivalents when the dynamic content changes) and states that any dynamic changes which occur based on multimedia content (either in a "frame," "img," "object," or "script") must also update the "alt" element when it changes.
13.	Content tracking	Provide assistive technology users the option to skip navigation links with an appropriate method.	There are a number of methods of facilitating navigation for users of assistive technology. Be consistent in page-to-page design, designers can provide a jump-link to bypass a series of links on a page similar to the "back to top" used in long pages, when using multiple links close together, separate the links so the reader software can parse it correctly. Links should be referenced with text which make sense if a user if link-jumping. Also, consider adding a site map, which is useful to nearly everyone.
Table 2-1 (taken from the U.S. Architectural and Transportation Barriers Compliance Board Recommendations)			

The sites listed below are online tools which can help assess a site's accessibility

- The **Center for Applied Special Technolgy** - **CAST** - provides Bobby a tool which provides an accessibility rating for websites.
- The **World Wide Web Consortium** - **W3C** - provides Web Accessibility Report Tool which assists in resolving vexing accessibility issues.
- The State of **Pennsylvania's Initaitive on Assistive Technology** – **PIAT** provides WAVE which assesses websites by providing a linear reading of the site as if through reader software.

This document was assembled to assist NASA webmasters in the goal of making all Government websites accessible. Additional links and/or source material is invited. Please forward suggestions or corrections to Charles Redmond, NASA HQ Webmaster.

Accessible HTML

Appendix 1

Images and Animations

✓ The alt="text" attribute is used in image tags to describe graphics

– allows for a text description of a graphic to reside beneath the actual graphic

– text description is not visible but is invaluable in describing the image to a text-based user

✓ <img src="images/bbstop.jpg" alt="cartoon of bugs bunny holding a stop sign">

Graphical Bullets

✓ All graphical bullets should have an alt tag
  - alt="item"
  - alt="*"
  - alt=" " (graphical information with no communicative value)

✓ Graphics used as a bullet can be a problem

✓ Not the default bullets of an unordered list

✓ With alt=" ", people listening to the page are not subjected to unnecessary speech.

Banners

✓ Use "D-tags" to describe banner content

- Capital "D" appears next to or below an image
- Link to a page with a description of the graphic
- Users receive more information than alt text

✓ `<a href="longdesc.html">D</a>`

Client-side Image Maps

✔ Incorporate text descriptions in alt tags for image map links

✔ Example

```
<map name="top-nav">
  <area shape="rect" coords="0,19,139,38"
    href="guestbook.html" alt="Feedback">
  <area shape="rect" coords="0,0,139,18"
    href="sponsors.html" alt="Sponsors">
</map>
```

Server-side Image Maps

✓Include alternative text links a list of equivalent text links, one for each URL that can be activated through the map.

✓Otherwise maps will not be accessible to text browsers or browsers with images off

✓A server-side map of the United States needs a list of the individual states

Graphs and Charts

✓Summarize content of each graph and chart
   – Include an "alt" tag description of the graphic
   – Include a text description following the image

✓Use the longdesc attribute for each
   – Use a "D-Link" with a URL to the detailed description or the data

Multimedia

✓Provide text transcriptions of all video clips

✓If possible include captions or text tracks with a description of the sounds

– For the hearing disabled, audio content is not accessible

– For the vision disabled, videos without descriptions are not accessible

✓ National Center for Accessible Media

Scripts, Applets, and Plug-ins

✓Provide alternate content in text form

– Ensure pages still function with the scripts tuned off

– Provide alt text for Applets

<applet code="forward.class" width="300
height="350" alt="Java forward applet">...</applet>

– Insert a text description in the object tag

<object classid="java:forward:class" width="300"
height="350">Moving forward creates friction...
</object>

Forms

✔ Provide an alternative downloadable version that can be faxed or mailed in, or a phone number

✔ Provide equivalent HTML or ASCII forms for all documents presented in PDF, PS, WORD or other formats that may not be accessible

Frames

✓Previous/current advise was/is to provide content elsewhere in a non-frame format

– Use noframes tag to provide a default for browsers that cannot view frames

✓Current/future advise is to use names

– Frame names should be informative

Tables

✓Avoid word wrapping

✓If word wrapping cannot be avoided, provide an alternate text-only page

✓Define table information

– Caption element provides a visible title

– <caption>Jelly beans eaten by each child</caption>

– Summary attribute provides "hidden" information

– <table border="1" summary="text">

– Use the <th id=""> tag

Correct Markup

✓ Structural markup, such as headings and lists and blockquote are not used for visual presentation effects

✓ Tables have been and continue to be used incorrectly for positioning but until CSS is widely supported…

  – Use caption or summary to explain (mis)use of table

Skip to Main Content

✓ "Hidden" skip over the navigation links often found at the top and left of a page to the main content

<img src="blank.gif" alt="skip to main content">

<h1> The main content...</h1>

✓ Display a "skip navigation" link at the top of the page

Readable Links

✓Ensure links make sense when read out of context

Click here for text version of this page

✓Separate links on consecutive lines by space, spacebar, space

✓Separate consecutive links on one line by a space and a vertical bar on either side of the links - also separates links for visual users.

Navigation

✓ Ensure navigation buttons are in a consistent location on each page

✓ Provide large, easy to read buttons

✓ Include text links for all navigational graphics

✓ Navigation at the side limits the display area, making text size increase difficult

Site Layout

✓ Important information should be no more than three clicks away

✓ If a site with multiple layers is necessary, provide a link to skip to main content or index

✓ Three clicks rule helps eliminate confusion and navigation difficulties for disabled users

Sitemaps

✓Textual sitemap allows users with a screen reader to find information quickly and easily by tabbing through the links

✓Ensure that your sitemap is easy to get to from each of your pages.

Body Tag Color Schemes

✓ Define all color schemes in body tag

– Use high contrast colors used for greater visibility
– Color schemes

  – background image (if using one)
  – background color (always define even if using image)
  – color of link
  – color of activating link
  – color of visited link
  – text color

```
<BODY BACKGROUND="image.gif" BGCOLOR="#ffffff" LINK="#990099"
    VLINK="#009999" ALINK="#000099" TEXT="#000000">
```

Text Guidelines

✓ All text contrasts well with background

✓ Text size if defined is 14 points or larger for body text, headlines 24 points or larger

✓ Sans-serif fonts used whenever possible

✓ Body text flush left or justified.

✓ D^{rop} C^{apitals} are avoided

✓ Blinking or flashing text is eliminated

Timing Out

✓Ensure no timed messages or pages

- – Assistive technology may not read the document fast enough to convey all the information

- – Very frustrating to be halfway through a document and the text disappears

- – There is no way for a user to turn timed messages off.

Cascading Style Sheets (CSS)

Appendix 2

CSS Overview

✓ Flexible and Cross-platform

✓ Standards-based
- http://www.w3.org/TR/REC-CSS2/

✓ More Information
- W3C: http://www.w3.org/Style/css/
- CSS Pointers Group: http://css.nu/index.html
- CSS Bugs and Workarounds: http://css.nu/pointers/bugs.html

✓ Tutorial
http://WDVL.Internet.com/Authoring/Style/Sheets/Tutorial.html

CSS Accessibility Features

✓ Separates document structure from presentation

✓ Precise control over spacing, alignment and positioning. Authors can thereby avoid "tag and/or image misuse"

✓ Provides precise control over font size, color, and style

✓ Allows user to override author styles

Cascading Style Sheets

✓Cascading stylesheets promise to make the Web a better place by controlling layout

- – Smaller, faster pages
- – Easily maintain many pages at once

✓The key word is **promise**

- – Varying degrees of browser support
- – Incomplete implementations (worse than none)
- – Extensions and non-standard properties

CSS Is Browser Friendly

✓ CSS code degrades gracefully
- – No glaring broken icon for a missing plug-in
- – No code gibberish if using an older browser

✓ Browsers that recognize CSS use it

✓ Browsers that don't recognize CSS ignore it
- – Problem with incomplete CSS implementation

CSS Master Compatibility Chart

http://webreview.com/wr/pub/guides/style/mastergrid.html

updated 2 April 2000

CSS Resources

✔The House of Style CSS Resources

– http://www.westciv.com/style_master/house/index_plain.html

✔Overview of the CSS Specification

– http://webreview.com/wr/pub/guides/style/glossary.html

✔Accessibility Features of CSS 2

http://www.w3.org/TR/CSS-access.html